Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Formosa Plastics Corp
Formosa Plastics Corp Louisiana - Baton Rouge Plant
Baton Rouge, East Baton Rouge **Parish, Louisiana**
Agency Interest Number: 288
Activity Number: PER20070010
Proposed Permit Number: 2915-V1

I. APPLICANT

Company:
Formosa Plastics Corp Louisiana - Baton Rouge Plant
PO Box 271
Baton Rouge, Louisiana 70821-0271

Facility:
Formosa Plastics Corp
N end of Gulf States Rd
Baton Rouge,East Baton Rouge Parish, Louisiana
Approximate UTM coordinates are 673.829 kilometers East and 3375.528 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS

Formosa Plastics Corp LA, (FPC-LA), is an existing synthetic organic chemical manufacturing industry (SOCMI) facility consisting of three units – a Vinyl Chloride/EDC Units (VCM), a Polyvinyl Chloride Unit (PVC), and a Utilities Unit. The site is located in East Baton Rouge Parish and has been in operation over 40 years. A caustic chlorine unit as well as one of two vinyl chloride monomer (VCM1) has been permanently shut down and are no longer in operation.

The Baton Rouge Plant operated under State Permit 0840-00002-10 and PSD-LA-560 (M-2) issued March 7, 1997, and PSD-LA-560 (M-1) issued March 2, 1995, until the Part 70 Operating Permit replacing the state permit was broken into three unit-wide permits. The caustic chlorine unit and the VCM1 unit were permanently shut down before their TV permits were issued.

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Formosa Plastics Corp Louisiana - Baton Rouge Plant is a designated Part 70 source. Several Part 70 permits have been issued to the operating units within the complex. These include:

Permit No.	Unit or Source	Date Issued
PVC Unit	1004-V0	10/24/2001
VCM Unit	0840-00002-V0	8/9/2007
Utilities Unit	2915-V0	10/16/2006

In addition, PSD Permits PSD-LA-546 (M1), issued 11/17/1990 and amended 12/8/2000, as well as PSD-LA-560 (M3), issued 9/12/2006 and later amended 10/16/2006, were also issued to the complex.

The Utilities Unit currently consists of three gas turbines, three boilers, a process water treatment plant, an electrical power substation, and an air separation unit that produces oxygen, nitrogen, and argon.

The three gas turbines are General Electric combined-cycle turbines. The total yearly average output of the turbines is 998,640 MW-hrs. The rating for each gas turbine at a temperature of 59 °F is approximately 38 MW. The maximum generator rating for Gas Turbines No. 1, No. 2, and No. 3 are 44.9 MW, 47.5 MW, and 47.5 MW respectively. Gas Turbine No. 1 was constructed in 1984 and Gas Turbine No. 2 was constructed in 1989. Gas Turbine No. 3 installation was completed in August of 1996 and has been operated since that time. All turbines are fired using only natural gas.

Each gas turbine exhausts through a Heat Recovery Steam Generator (HRSG) that is outfitted with an associated supplemental firing system (duct burner). This system produces high pressure steam that is routed through two steam turbines. A gas turbine and its associated HRSG are capable of producing 140,000 pounds of steam per hour at 1,314 psig and 905 °F without supplemental firing. With supplemental firing, each duct burner is capable of producing an additional 100,000 pounds per hour at ISO conditions with 15% oxygen. The duct burners for Gas Turbines No. 1 and No. 2 have the capability to fire natural gas or a combination of natural gas and hydrogen produced in Formosa's chlorine plant (currently shut down). However, Formosa shall operate Gas Turbines No. 1 & No. 2 with natural gas only. The duct burner for Gas Turbine No. 3 burns natural gas only.

Each of the steam turbines associated with the HRSGs are capable of producing 12 MW with an inlet flow of 245,000 pounds per hour of steam. The electricity and plant steam requirements for 300 psig and 135 psig service are provided by the turbines and HRSGs.

Although the basis for Utilities Unit operation is the operation of all three turbines and associated HRSGs, beginning in 2003, changes in other plant areas resulted in reduced requirements for both power and steam. A significant reduction in energy demand occurred as a result of the idling of the Caustic-Chlorine Unit and the EDC Unit of the VCM I plant. The reduction in energy demand resulted in the need to idle one of the gas turbines. In turn, although overall energy demand at the facility is down, the remaining energy demands can best be satisfied by a heavier reliance on Package Boiler A, since operation of a third turbine is not warranted.

Emission controls are utilized on the turbines. Gas Turbines No. 1 and No. 2 are both equipped with steam injection and typically operate with a steam to fuel injection ratio of 1:1. Gas Turbine No. 2 has a steam flow program that determines a steam injection rate based on fuel flow rates, ambient temperature, and the approximate specific humidity. This program calculates the steam injection rate for emissions compliance. The steam injection control system determines steam flow at a rate higher than that required for compliance. This offset ensures compliance with the expected control system dead band and operational transients. Gas Turbine No. 3 is equipped with a dry low NO_x technology to achieve a guaranteed 9.0 ppmv NO_x annual emission level.

The standby boilers (Package Boilers A and B1) provide swing load process steam, allowing the turbines to operate at constant rates as steam demand varies. The boilers also provide for plant steam during gas turbine downtime. Package Boiler A is rated at 92.7 MMBTU-HHV/hour.

The design basis for the Utilities Unit required the operation of all three turbines and associated HRSGs to supply overall plant electrical and steam needs. In order to maintain emissions within the proposed cap limits including the addition of the new package boilers, FPC-LA proposes to restrict the operation of the combustion sources in the emission cap in conjunction with the new boilers. The Utilities Unit has designed five alternate operating scenarios for the operation of the new boilers within the combustion emissions cap. Optimization of the supply of steam is desired, therefore, once the plant electrical and steam demands are quantified, the permittee shall determine which operating scenario provides the required steam to support facility needs. These scenarios are described below:

Scenario 1 – Gas Turbine No. 3 and either Gas Turbine No. 1 or Gas Turbine No. 2 may be operated simultaneously. Package Boilers A and either B1 **or** B2 may operate with Gas Turbine No. 3 and either Gas Turbine No. 1 or Gas Turbine No. 2.

Scenario 2 – Gas Turbine/HRSG No. 3 and either Gas Turbine/HRSG No. 1 **or** Gas Turbine/HRSG No. 2 may be operated simultaneously. Package Boiler B1/B2 shall not operate simultaneously with simultaneous operation of all three Gas Turbines/HRSGs, except during periods of startup or shutdown. Package Boilers A

and B1/B2 may operate with Gas Turbine/HRSG No.3 and either Gas Turbine/HRSG No. 1 or Gas Turbine/HRSG No. 2.

Scenario 3 – Package Boilers A and B1/B2 may operate with any one of the three Gas Turbines/HRSGs.

Scenario 4 – Gas Turbine/HRSG No. 3 and either Gas Turbine No. 1 or Gas Turbine No. 2 may operate in this scenario. HRSG No. 1 and HRSG No. 2 shall not operate in this scenario. Package Boilers A and B1/B2 may operate with Gas Turbine/HRSG No. 3 and either Gas Turbine #1 **or** Gas Turbine #2.

Scenario 5 – HRSG #3 shall not operate in this scenario. Package Boilers A and B1/B2 may operate with Gas Turbine No. 3 and either Gas Turbine/HRSG No. 1 **or** Gas Turbine/HRSG No. 2.

The Utilities Unit is connected to the Entergy power grid through a FPC-owned power station. Although FPC-LA does sell small amounts of excess generated electrical power to Entergy, the Utilities Unit has never sold more than one-third of the Potential Electrical Output Capacity (PEOC) and no more than 219,000 MW-hr/year from any of the three electricity generators. There are no significant air-emissions sources present in the Entergy substation area and no polychlorinated biphenyl compounds are used onsite.

The Utilities Unit operates a process water treatment plant, consisting of several insignificant sources—primarily open-top process water treatment units. No significant amount of VOCs or HAPs are emitted from these boiler feed water treatment processes. The unit also contains a cooling tower used for process-area cooling requirements.

The N_2/O_2 unit produces oxygen, nitrogen, and argon through an air separation process. The air is filtered and compressed to remove particles and moisture. The air dryer absorbers remove all remaining water vapor and carbon dioxide from the air stream. The dried air stream is then split into two volumes for further processing. Approximately 20% of the air is compressed, cooled using a countercurrent flow of cold pure nitrogen, and passed through an expander.

The remaining 80% of the air enters the air separation unit where it is cooled to cryogenic temperature. The cryogenically cooled air then enters a high pressure column to separate oxygen at the top and nitrogen at the bottom. Nitrogen is condensed and concentrated through a reflux nitrogen sub-cooler. The major part of the stream then passes through a crude argon condenser. The crude argon is separated into liquid and vapor forms. The liquid argon is vaporized. Water is removed from the gasified argon by adding hydrogen. The dry argon is chilled by heat exchangers, purified and stored.

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application and Emission Inventory Questionnaire dated May 22, 2007 requesting a modification to the TV permit and the PSD permit was received on May 29, 2007. Additional information dated August 29, October 12, 31, and November 1, 2007 was also received.

Project

With this modification, Formosa is requesting the following:

- Correction to the permit expiration date from August 1, 2011 to September 12, 2011.
- Addition of a hydrochloric acid tank UT-505B, as an insignificant source. UT-505B will be constructed and operated similarly as UT-505, Formosa's existing Hydrochloric Acid Tank. As with UT-505, Formosa conservatively estimates the HCl emissions from UT-505B to be approximately 75 lb/yr. Even with two tanks emitting HCl, their total emissions is less than the Minimum Emissions Rate (MER) of 500 lbs/yr.
- Higher maximum hourly emission rates to account for operation of 212-Cogeneration Unit No. 3, EQT009, at conditions other than steady state (e.g., during start-ups, shutdowns, and/ or when operating at loads less than 25 MW). Annual permitted emissions rates will not change. The requested emissions are based, in part, on vendor data from the gas turbine manufacturer and LDEQ NO_X RACT requirement at LAC 33:III.2201. The unit will be allowed to operate at maximum lb/hr emissions rates as follows.

Max Lb/Hr Emissions Rates for Cogeneration Unit No. 3 (Startups and Shutdowns and/or Loads ≤ 25 MW)			
	Gas Turbine No. 3 (Source ID 212A)	**HRSG No. 3** (Source ID 212B)	**Cogeneration Unit No. 3 (Source ID 212)**
NOx	109.09 max lb/hr (at heat input of 320 MM BTU/hr)	12.20 max lb/hr (at heat input of 122 MM BTU/hr)	**121.29** max lb/hr
CO	75.02 (max lb/hr) (at heat input of 170 MM BTU/hr)	10.69 max lb/hr (at heat input of 122 MM BTU/hr)	**85.71** max lb/hr

- Replacement of one of two existing emergency fire pump engines (525 hp North Firewater Pump Engine) currently permitted as a General Condition XVII activity. The new pump engine has applicable federal requirements (40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII) and needs to be

permitted as point source. FPC has also requested to increase hours of operation from 215 hrs/yr to 450 hrs/yr.

- An increase in the hours of operation for emergency fire pump engine (525 hp South Firewater Pump engine) from 215 hrs/yr to 450 hrs/yr. The pump is currently permitted as GCXVII activity.
- Replacement of two out of three cells from the existing cooling tower, Source ID 220, at the Utilities Unit.
- Removal of NESHAP 40 CFR 63 Subpart DDDDD requirements from the permit, specifically the Package Boilers B1 & B2 (EQT077 and EQT131). Sources that were subject to the vacated Boiler MACT may now be subject to case-by-case MACT under Clean Air Act Section 112(g) or 112(j). The EPA is in the process of determining if case-by-case MACT was triggered when the court vacated the Boiler MACT. If case-by-case MACT was triggered, FPC will be notified by letter. Sources affected by case-by-case MACT will be required to file a permit application in accordance with 40 CFR part 63 subpart B requesting that the State issue a case-by-case MACT determination.
- Updating the emissions from the commonly vented gasoline tanks, EIQ 170, to reflect negligible emissions from benzene, toluene, xylene, n-hexane, and 2,2,4-trimethyl pentane.
- Removal from the current permit the boiler, Emission Point EQT008, 205 – Package Boilers B and C. The boilers have been permanently removed from the site. Additionally, GRP008, Utilities Unit Combustion CAP (Includes Boilers B&C Vent), will be removed from the permit as well.
- The description for GRP030 "Utility Unit Combustion Cap (includes Boilers B1/B2) - Boilers B&C shall not operate" has been changed to GRP030 "Utilities Unit Combustion Cap."

Proposed Permit

Permit 2915-V1 will be a modification to the initial Part 70 operating permit 2915-V0, for the Utilities Unit.

Permitted Air Emissions

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	39.38	36.06	-3.32
SO_2	22.69	22.93	+0.24
NO_X	642.74	643.96	+1.22
CO	350.65	351.33	+0.68
VOC*	35.53	35.74	+0.21

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*VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Acetaldehyde	0.26	0.26	-
Acrolein	0.04	0.04	-
Benzene	0.08	0.08	-
Chloroform	-	0.15	+0.15
Ethylbenzene	0.20	0.20	-
Formaldehyde	4.68	4.68	-
Napthalene	0.01	0.01	-
PAH	0.01	0.01	-
Toluene	0.84	0.84	-
Xylenes	0.41	0.41	-
n-Hexane	4.64	4.64	-
2,2,4-Trimethyl pentane	-	<0.01	+<0.01
Total	11.17	11.32	+0.15

Non-VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Chlorine	3.42	3.65	+0.23

IV REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.

Applicability and Exemptions of Selected Subject Items

For this modification, the permit was reviewed for compliance with 40 CFR 70, the Louisiana Air Quality Regulations, 40 CFR 64 (CAM) and Prevention of Significant Deterioration (PSD). A modification to the existing PSD is required due to the increase in lb/hr max of CO and NOx for the turbine at conditions other than steady state (e.g., during startups, shutdowns, and/or when operating at loads <= 25 MW). The requested emissions are based, in part, on vendor data from the gas turbine manufacturer and LDEQ NO_X RACT requirement at LAC 33:III.2201.

The gas turbines and duct burners (HRSGs), EQT002/Cogeneration Unit 1, EQT003/Cogeneration Unit 2 and EQT012/Cogeneration Unit 3, are subject to New Source Performance Standards (NSPS) (40 CFR 60 Subpart GG and 40 CFR 60 Subpart Db).

40 CFR 60 Subpart Db applies to the boilers EQT077/Package Boiler B1 (229A) and EQT131/Package Boilers B2 (229B).

Compliance Assurance Monitoring (CAM), 40 CFR 64, is applicable to any major source unit that has the potential to emit greater than 100 tons of a regulated air pollutant after controls (post-control), defined as a pollutant specific emission unit (PSEU). CAM, however, is not applicable to emission units EQT002/Cogeneration 1 (166), EQT003/Cogeneration 2 (167), and EQT009/Cogeneration Unit 3 (212), because NOx, the pollutant requiring control, does not have any monitoring requirements according to a determination made by EPA dated April 24, 2001 regarding industrial gas turbines having a heat input at peak load greater than 100 MMBTU/hr and a manufacturer's rated base load at ISO conditions greater than 30 MW, per 40 CFR 60.332 (40 CFR 60 Subpart GG). Any monitoring for NO_x required by 40 CFR 60 Subpart GG would have been considered CAM for these emission units. The other emission units in the Utilities Unit are not PSEUs.

Prevention of Significant Deterioration/Nonattainment Review

PSD/non-attainment review was not required. The minor mod to the PSD did not increase the annual emissions.

Streamlined Equipment Leak Monitoring Program

None.

MACT Requirements

{Insert MACT requirements and analysis here.}

Air Quality Analysis

A preliminary analysis was previously made on the effects associated with both the potential emissions from the boilers and the three gas turbines. Results from the preliminary analysis indicated no significant impact. The emissions increases from this project indicated no significant impact either.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

A permit shield was not requested.

VI. PERIODIC MONITORING

Specific monitoring requirements associated with the ratio of steam to fuel on two of the gas turbines have been included in the Facility Specific Requirements of the draft permit. In addition, the Alternative Monitoring Plan requires more frequent monitoring of specific turbine parameters during the ozone season and defines emission factors to be used for evaluating NO_x and CO discharge rates. The requirements of this plan have also been included in the Facility Specific Requirements of the draft permit.

Compliance Assurance Monitoring (CAM), 40 CFR 64, is applicable to any major source unit that has the potential to emit greater than 100 tons of a regulated air

pollutant after controls (post-control), defined as a pollutant specific emission unit (PSEU). CAM, however, is not applicable to emission units EQT002/Cogeneration 1 (166), EQT003/Cogeneration 2 (167), and EQT009/Cogeneration Unit 3 (212), because NOx, the pollutant requiring control, does not have any monitoring requirements according to a determination made by EPA dated April 24, 2001 regarding industrial gas turbines having a heat input at peak load greater than 100 MMBTU/hr and a manufacturer's rated base load at ISO conditions greater than 30 MW, per 40 CFR 60.332 (40 CFR 60 Subpart GG). Any monitoring for NO_x required by 40 CFR 60 Subpart GG would have been considered CAM for these emission units. The other emission units in the Utilities Unit are not PSEUs.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per

year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO_2) – An oxide of sulfur.

Sulfuric Acid (H_2SO_4) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.